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ant surgeon U. S. A., published as No. 7 of Professor Hayden's Miscellaneous Publications. The work forms an octavo volume of 240 pages, and contains, in addition to the grammar and dictionary proper, a very valuable monograph of the Hidatsa, and of their neighbors at Fort Berthold, the Aricarees and Mandans.

Dr. Dalrymple, of Baltimore, has made an exhaustive study of the Pamunkey and Mattapony Indians of Eastern Virginia. They are a miserable half-breed remnant of the once powerful Virginia tribes. The most interesting feature of their present condition is their preservation of their ancient modes of making pottery. It will be news to some that the shells are calcined before mixing with the clay, and that at least one third of the compound is triturated shells.

The discussion of the subject of reform spelling still continues in *The Academy* of June 2d, 9th, and 16th. The chief value of this discussion to the American ethnologist is the aid which a perfect phonetic alphabet would render to those who are engaged in collecting vocabularies or in perfecting the synonymy of the tribes. — OTIS T. MASON.

GEOLOGY AND PALÆONTOLOGY.

ON THE EXISTENCE OF THE ALLEGHANY DIVISION OF THE APPALACHIAN RANGE WITHIN THE HUDSON VALLEY. — In preparing for the last summer campaign of the Harvard Summer School of Geology, my assistant, Mr. William M. Davis, Jr., made a preliminary study of the district lying between the Hudson River and the foot of the Catskill Mountains. From his observations it became evident to both of us that there were peculiar disturbances affecting this district which had remained unnoticed by the officers of the New York surveys. Last month I visited this region along with the Summer School of Geology. A few days' study made it plain to me that Mr. Davis's observations had given us a clew to an important fact in American geology, and that these dislocations, consisting of several abruptly folded anticlinals and synclinals originally having several hundred feet relief, are in fact the northward extension of the disturbances that made the Alleghany division of the Appalachian chain; while the Catskill Mountains similarly are the northward extension of the slightly disturbed table-land known as the Cumberland table-land in the valley of that stream, and by various names in the more northern localities. It will not be possible to give full details of this interesting series of disturbances until the sections and maps made by the summer school are fully worked up, which cannot be for some months to come. It may be said, however, that this structure has been traced about thirty miles along the Hudson River, and that the several anticlinals closely resemble those of Pennsylvania in all their general features: they are, however, smaller, more closely packed together, with much steeper dips, often running up to 50° of declivity, and are somewhat more faulted, but in the direction of their steeper dips their relations to each other, as well as in all the topographical effects they exercise on the surface, they exactly reproduce the Pennsylvania mountains. I now have no question that the Alleghany disturbances are crowded into the valley of the Hudson, where, worn down by glacial, fluviatile, and at times perhaps marine agencies, and masked by glacial drift, they have hitherto escaped the attention of geologists, and that we must abandon the idea that the disturbances of that age run out beneath the Catskill table-lands.

That it may be seen that these anticlinals are no petty accidents, I may say that the largest yet traced is not less than twenty miles long, a mile or more in width, and if restored would be nearly two thousand feet high. The beds involved in the disturbance include the greater part of the New York Palæozoic section. — N. S. SHALER.

ON THE OCCURRENCE OF THE GENUS BEATRICEA IN KENTUCKY. — The genus *Beatricea* described by Billings as a group of fossil corals, and at one time regarded by Hyatt as belonging to the Cephalopods,[1] has hitherto been found only upon the island of Anticosti, in the Gulf of St. Lawrence. The investigations of the Kentucky Geological Survey have now traced this genus into the limits of that commonwealth. There, as in Anticosti, it is the companion of reef-building forms of corals growing in the shelter of very large masses of *Columnaria* and *Tetradium*, and occupying the horizon of the uppermost part of the Cincinnati group. In the new locality the genus is represented by two distinct forms, comparable with the *B. nodulosa* and *B. undulata* of Billings, though perhaps not strictly identical with them. Specimens of these Kentucky forms were exhibited at Nashville. Professor Whitfield, there called attention to the fact that the microscopic structure of this puzzling fossil closely resembled that found in the *Stromatopora* group. On further examination of these forms I am inclined to accept the conclusions to which we are led by this acute observation of Professor Whitfield and to regard these fossils as probably belonging to the group of sponges. Those who are familiar with the Palæozic sponges will recognize certain approaches to the general form of *Beatricea* among the unquestionable sponges of that time. Certainly the affinities as far as traced are much more reconcilable with those of the group of sponges than with those of the corals. I think this is a more profitable field of inquiry than any other that has suggested itself to me concerning these curious remains. For some years I have been doubting whether they had not some genetic relations with the *Hippurite* group of the *Rudistes.* I should not mention this conjecture, though there is a good deal that appears to support it, were it not that Prof. James Hall tells me he has been inclined to take the same view of their relations. There can be no doubt, however, that the field opened by Professor Whitfield's observations is much more promising. — N. S. SHALER.

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[1] I am authorized by Professor Hyatt to say that he is now satisfied that they cannot be regarded as Cephalopods.

THE LARGEST KNOWN SAURIAN. — Professor Cope recently described a new genus and species of saurian with ambulatory limbs under the name of *Camæosaurus supremus*, which exceeds in dimensions any known land animal. The skeleton was found by Mr. O. W. Lucas near Canyon City, Colorado, and a great part of it was preserved in good condition through the labors of that gentleman. Its dorsal vertebræ are occupied by large chambers, a structure in which it differs from *Cetiosaurus*, a genus which it otherwise resembles. Its neck vertebræ are of remarkable form, and the neural arches of the dorsal vertebræ greatly elevated. One of the dorsal vertebræ has an expanse of three and one half feet; another is two and a half feet in elevation. The femur measures over six feet in length, and the tail was very long. If the cervical series included six vertebræ of the proportions of the one preserved the neck was ten feet in length. Another species allied to this one was recently sent to the Yale College museum from a point about one hundred miles north of Canyon City, but it appears to be a smaller animal, and the bones are in an inferior state of preservation.

REMAINS OF A HUGE SAURIAN IN PENNSYLVANIA. — At the recent meeting of the American Philosophical Society, Professor Cope called the attention of the members to a number of teeth of a huge land saurian which evidently inhabited Pennsylvania at an early geological period. The specimens were found by Charles M. Wheatley, of Phœnixville, Pa., in one of the copper mines, in the red sandstone and shale which traverses the State from northeast to southwest, in the eastern section. This reptile, which is new to science, was probably thirty feet in length, with a bulky body, supported by heavy limbs. The teeth are double-edged and finely serrate, and of the kind characteristic of the carnivorous saurians. The reptile was doubtless one of the most formidable that ever inhabited the State, and in point of time the earliest. It has received the name of *Palæoctonus Appalachianus*.

NEW VERTEBRATE FOSSILS. — Prof. O. C. Marsh, in the *American Journal of Science* for September, describes several new species of mammals, birds, reptiles, and fishes from different localities in the West. "Among the mammals are two Miocene Edentates, the first detected in this country, and a third species of this group from the Lower Pliocene. Another mammal of much interest is a rhinoceros from the Eocene, the oldest known member of the family. A number of new genera are introduced, some of which have an important bearing on the genealogy of Tertiary mammals. Among the other vertebrates is a new genus of Crocodilians from the horizon of the Wealden, and a new species of *Crocodilus* from the Pliocene." A new tapiroid animal, intermediate in structure between the extinct *Lophiodon* and the existing tapir, is described from remains from the Miocene of New Jersey (formerly referred to *Lophiodon*) and the Lower Pliocene east of the Rocky Mountains. Two species of *Bison* (*B. ferox* and *B. Alleni*) from the Lower Pliocene of Kansas and Nebraska are based on fragments of horn cores. These indicate animals much larger than the existing species, but smaller than the large extinct *Bison latifrons.* Another interesting type of mammal combines some of the features of the ungulates with others of the rodents, to which latter it is evidently related. The species (*Allomys nitens*) is founded on remains from the Upper Miocene of Oregon, and is regarded as representing a distinct family, *Allomyidæ.* A new bird of the size of a small duck is characterized from remains from the Cretaceous of Texas.

GEOGRAPHY AND EXPLORATION.

EXPLORATION IN PATAGONIA. — Don F. P. Moreno has recently made an exploration from Santa Cruz Bay, by way of the Santa Cruz River, northward across the high interior of Patagonia, the so-called "Plains of Mystery" of Admiral Fitz Roy, to the base of the Cordilleras. He explored the lake, which had never before been sailed upon, forming the source of the Santa Cruz, and crossed the tertiary tablelands to the northward. These plains have an altitude of two thousand five hundred to three thousand feet, with summits capped with basalt. To the westward and northward he met with a chain of small lakes inclosed by excellent pasture, and later reached an unknown lake of considerable dimensions, named by him Lago San Martin. The lake is surrounded with snow-capped mountains, which are wooded on the sides and rise to a height of three thousand to five thousand feet. He also visited the so-called Viedma Lake, and made collections of fossils from the plains. On a portion of the shores of the lake from which the Santa Cruz takes its rise was discovered an ancient habitation of some of the primitive people of Patagonia. A detailed report of his expedition is promised.

HEIGHTS IN THE BOLIVIAN ANDES. — According to the *Geographical Magazine*, Mr. Minchin, the civil engineer who has been doing such useful geographical work in Bolivia, has determined, from the results of his leveling for the railways between La Paz and Lake Titicaca, the height of the peak of Illimani to be 22,224 feet, which he thinks cannot vary more than ten feet from its true height. It is hence about 175 feet lower than the elevation given by the most trustworthy measurements for the peak of Aconcagua in Chili, believed to be the highest point of the Andes. Mr. Minchin gives the height of Lake Titicaca as 12,545 feet, or 245 feet less than Pentland's height, based on barometric measurement. The height of Alto de la Paz is given as 13,389 feet, and that of Plaza Mayor, La Paz, as 11,946 feet.

GEOGRAPHICAL NEWS. — Mr. F. A. Edwards has published, in the *Gentleman's Magazine* for August, a paper on Colonel Gordon's Expedition to the Upper Nile Region, illustrated by a sketch map. The *Geographical Magazine* for August contains a sketch map of the coun-